New wastewater treatment filters will help provide drought-proof source of reclaimed water

Carnation will have five large membrane units called cassettes like the one shown above.

A close-up of the individual strands in action.

King County has selected a vendor for an innovative process that treats wastewater to such a high level it can be used safely as a drought-proof water source for irrigation, wetland enhancement and other beneficial uses. King County evaluated the opportunities to use reclaimed water in Carnation. The wetland enhancement emerged as the best use of the water because there are no viable year-round water users at this time. Potential reclaimed water users will be reevaluated in the future. Membrane technology will be installed to filter wastewater at both the Carnation and Brightwater wastewater treatment plants.

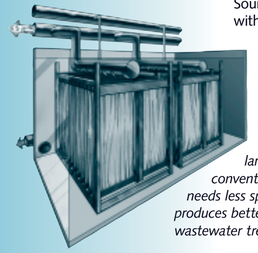
King County is buying the membranes from the Zenon Environmental Corp. of Ontario, Canada. Wastewater treatment plants in California, Colorado, Michigan, Georgia, Florida, Ontario and other locations around the world use Zenon membranes. Jurisdictions in other states and countries also use Zenon membranes to produce drinking water.

"We selected Zenon's membrane bioreactor system for our new plants because of its performance in providing consistently higher water quality," said King County Executive Ron Sims. "As we are planning to discharge the treated wastewater into the Snoqualmie River, protecting salmon, fish and people as well as the community of Carnation was imperative. We are confident that Zenon's technology will help us to preserve our surrounding environment."

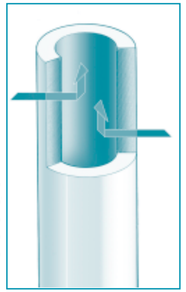
The Carnation system will use a membrane bioreactor (MBR) system instead of the large round settling tanks used in conventional plants. The membranes are immersed in wastewater. The MBR system will suck wastewater through hollow fibers with microscopic pores small enough to filter out particulate matter and even individual bacteria.

The MBR system can produce Class A reclaimed water, which meets strict standards of the state departments of Ecology and Health for use in nondrinking purposes.Those purposes include landscape and agricultural irrigation, heating and cooling, and industrial processing as well as safe discharges into freshwater. The Carnation plant will initially be able to treat 400,000 gallons a day.

"The wastewater will be seven to 10 times cleaner than typical secondary treated wastewater," Christie True, manager of the wastewater capital improvement program said. "Secondary treatment already meets tough environmental requirements for discharges into Puget Sound. By reducing the discharge of pollutants even more with the MBR process, we'll further improve water quality and protect the Snoqualmie River and surrounding environment."



The membrane bioreactor (MBR) system will be used instead of large round settling tanks used in conventional plants. The MBR system needs less space, simplifies odor control and produces better water quality than traditional wastewater treatment.



This close-up of an individual strand shows how gentle suction pulls clean water through microscopic pores.

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Department of Natural Resources and Parks
Wastewater Treatment Division
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Seattle, WA 98104-3855

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CARNATION WASTEWATER TREATMENT FACILITY

COMMUNITY MEETING

MAY 4, 2005, 6:30-8:30 P.M.

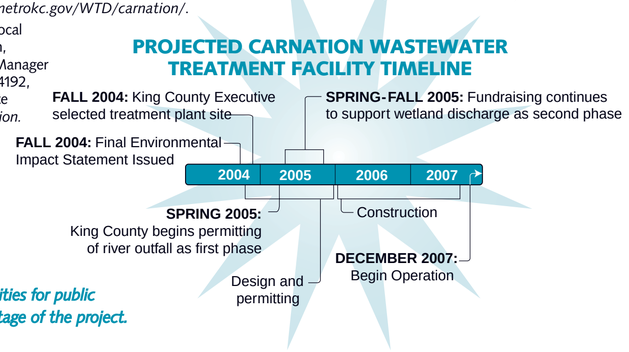
The information in this newsletter is available on request in accessible formats by calling 206-296-8361 or 711 (TTY).

OPPORTUNITIES FOR PUBLIC INPUT

Besides the public meeting on May 4, King County and the City of Carnation will continue to communicate with agencies, property owners and other interested parties, and to provide project updates and opportunities for input. To comment on the project, request accessible meeting accommodations or get more information on the treatment plant, call King County's Carnation Wastewater Treatment Plant Project Information Line at 206-263-5212 or toll-free at 1-800-325-6165, ext. 35212. Or send an e-mail message to *CarnationWWTP@metrokc.gov*, or check the project Web site at *http://dnr.metrokc.gov/WTD/carnation/*.

For information on the local sewage-collection system, contact Carnation City Manager Bill Brandon at 425-333-4192, or visit the city's Web site at *http://www.ci.carnation.wa.us/*.

PROJECTED CARNATION WASTEWATER TREATMENT FACILITY TIMELINE



There will be opportunities for public involvement at every stage of the project.

King County

CARNATION WASTEWATER TREATMENT FACILITY

PROJECT•UPDATE

April 2005

CARNATION WASTEWATER TREATMENT FACILITY COMMUNITY MEETING MAY 4, 2005

We hope you will join us at the next community meeting to learn how the Carnation Wastewater Treatment Facility is progressing.

At this meeting, you will:

- See what the treatment plant design will look like. You can meet the architect and tell him your opinions.
- Find out about the innovative design for a river outfall at Carnation Farm Road Bridge.
- Learn about funding efforts for a wetland enhancement alternative.
- Let us know what is on your mind, and ask project staff your questions.

Jeff McGraw is the Treatment Facility's architect.

Wednesday, May 4, 2005 6:30 – 8:30 p.m. (Presentation at 7 p.m.)
Carnation Elementary School, 4950 Tolt Ave., Carnation

BACKGROUND

The City of Carnation has determined that replacing on-site septic systems with a wastewater treatment facility is important to address public health concerns, achieve the city's comprehensive plan goals, and maintain and enhance community livability. The city contracted with King County to design, build and operate the treatment facility to serve Carnation's urban growth area.

In November 2004, King County Executive Ron Sims directed staff to carry forward both the river outfall and wetland enhancement discharge options for more study. He noted that preliminary estimates show the wetland would cost $2.5 million more than the river outfall, and he directed staff to spend six months developing partnerships and finding grants to make the wetlands an environmental amenity and an economically viable alternative.

WHERE WE ARE TODAY

County staff has made excellent progress in developing partnerships for funding and developing a wetland enhancement although no grant funds are in hand yet. We have determined that we need to move forward with permitting a river outfall to meet Carnation's schedule for having a wastewater system in operation in December 2007. However, we will continue to pursue funding for the wetland in the second phase of the project.

Getting the permit for the river outfall in a timely way is important for both the city and the county. The city must meet the financial obligations of the federal grants and loans for the project; the county must meet the schedule in its legal contract with the city to provide treatment for the city's wastewater.

Pursuing a river outfall now supports a phased approach to development of the wetland. During the second phase, after necessary funding has been obtained, the county hopes to create a wetland enhancement discharge. After the wetland discharge is completed, the river outfall could be used as a backup.

Clean water– a sound investment.

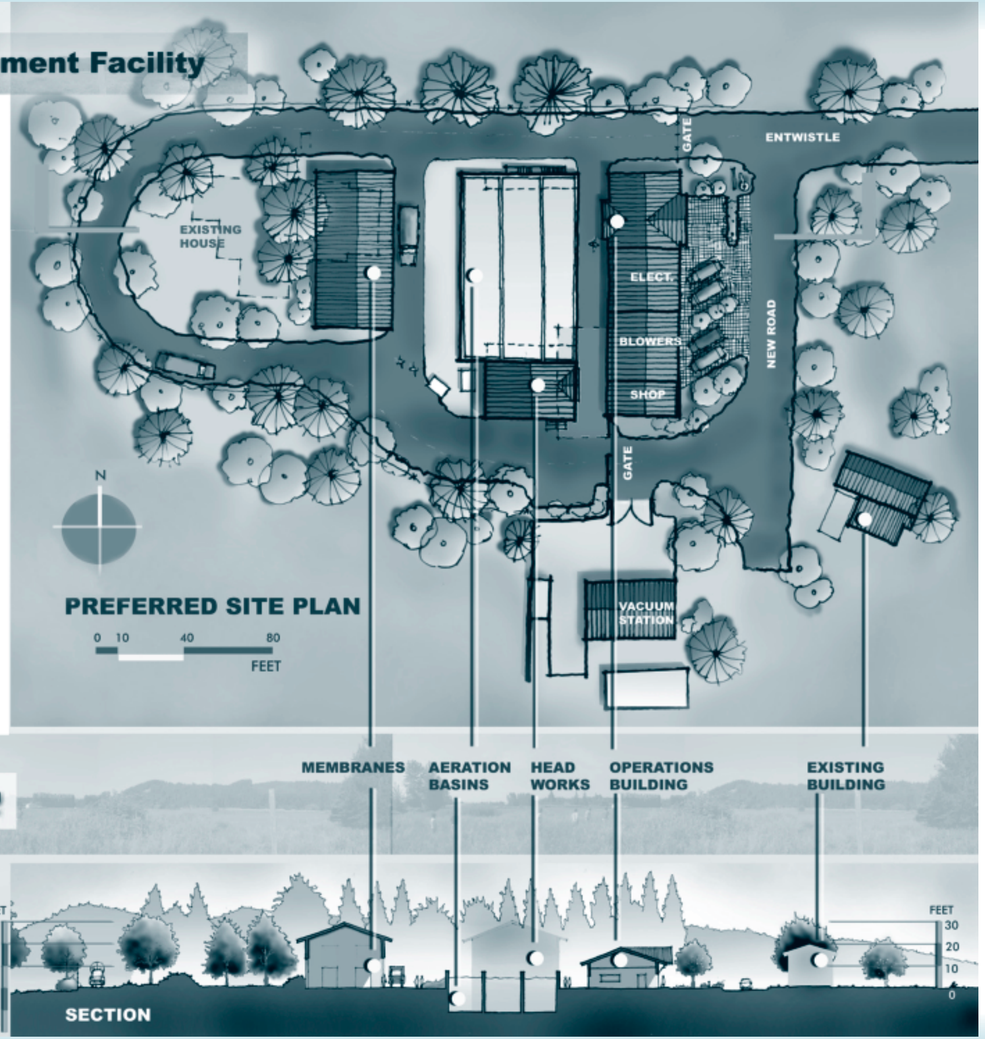
Carnation Wastewater Treatment Facility

Treatment Plant Design

Design and permitting is moving ahead for the Carnation Wastewater Treatment Plant. The new plant will be built at the west end of Entwistle Street, west of the business district and state Highway 203. Jeff McGraw, with Michael Willis Architects (MWA), is the architect for the project. Jeff has worked in the water and wastewater industries for 18 years. He has designed many award-winning facilities throughout the West that fit into neighborhoods and sensitive environmental areas.

Jeff will bring architectural renderings, floor plans and examples of proposed materials and finishes to the meeting on May 4th. A preliminary landscape plan will also be presented. At this meeting, people can view proposed concepts for the plant buildings and discuss the configuration, building materials and landscaping plans with the architect and engineering team.

The graphic on this page was presented at the March public meeting. If you attend the May meeting, you will see how the design is progressing. If you can't attend the meeting, call the project information line and we will send you updated copies of the treatment plant plans or look at the materials online at *http://dnr.metrokc.gov/WTD/carnation/* after the public meeting.



River outfall to be at Carnation Farm Road Bridge

A thorough analysis of the environment in the Snoqualmie River, including salmon habitat, was completed in conjunction with locating the river outfall. It is more expensive to build the outfall at the Carnation Farm Road bridge then to construct the discharge directly west of the treatment facility, but the Carnation Farm Road Bridge was selected because it will have less environmental impacts both during and after construction.

River outfall's innovative design will not harm salmon

One key way King County will be able to minimize environmental impacts during construction is by using the bridge itself for holding the pipe and then discharging to the river using an innovative "downspout" design. With this design, nearshore and in-water impacts will be minimized as a pipe will not have to be constructed in the river bed as required for a traditional river outfall.

During operation, discharge via the downspout to deeper water will provide better mixing compared to a traditional outfall, lessening impacts to fisheries downstream. Attaching the pipe to the bridge versus a discharge pipe installed along the river bed will also be easier to permit. The planned future wetland enhancement will complement the river outfall and will provide greater operational flexibility.

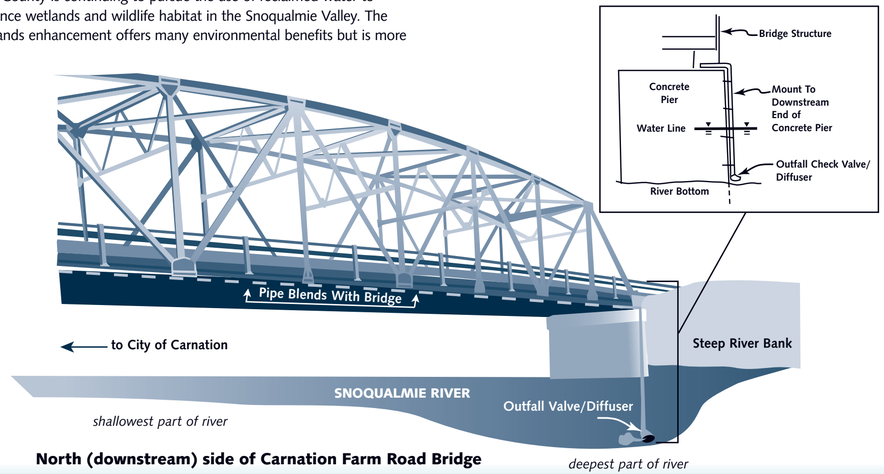
Wetland enhancement looking good as a second phase

King County is continuing to pursue the use of reclaimed water to enhance wetlands and wildlife habitat in the Snoqualmie Valley. The wetlands enhancement offers many environmental benefits but is more costly than discharging directly to the Snoqualmie River. The fund-raising team is conducting a thorough search for public and private funding for the wetlands enhancement. Staff involved is optimistic about getting several grants this year for the project. Ducks Unlimited (DU) is on board as a partner for this project and has been actively involved in fund raising.

More than 80 percent of the wetlands that once existed in the Snoqualmie Valley have been altered or removed. Adding the wetland enhancement component to the Carnation project fits into larger efforts to restore the greater Snoqualmie River Valley Watershed by creating and enhancing wetlands that will provide habitat continuity in this important ecosystem.

Using reclaimed water to create and enhance wetlands will directly and indirectly enhance habitat for many species, including amphibians, salmon, migratory birds, and mammals. The wetlands also mimic a more natural hydrology for introducing the water to the river.

The project team first looked at Stillwater Wildlife Area as the only alternative for a wetland enhancement. Piping the water more than 15,000 feet to Stillwater will cost much more than $1 million and finding funding to cover the pipe costs is proving difficult. While King County is still considering Stillwater, the project team is also looking at wetland options closer to the treatment plant to avoid the additional conveyance cost associated with the Stillwater location.



North (downstream) side of Carnation Farm Road Bridge